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U. S. DEPARTMENT OF AGRICULTURE-FOREST SERVICE  
California Forest and Range Experiment Station  
Division of Forest Insect Research

JEFFREY PINE BEETLE  
BADGER MOUNTAIN AREA, LASSEN VOLCANIC NATIONAL PARK  
AND LASSEN NATIONAL FOREST, CALIFORNIA  
SEPTEMBER 1954  
APPRAISAL SURVEY

Introduction

In 1953, an aggressive infestation of the Jeffrey pine beetle (Dendroctonus jeffreyi Hopk.) was found in old-growth Jeffrey pine in the vicinity of Badger Mountain, Shasta County. The infestation was located in an area between Lost Creek and Hat Creek on lands of the Lassen National Forest and Lassen Volcanic National Park. The gross acreage involved was about 6,000 acres, some of which contains excellent Jeffrey pine timber. These stands are interspersed however, with expanses of manzanita, lodgepole pine and thickets of white fir.

An appraisal survey of the infestation, made in September 1953, showed that the losses were severe enough to warrant control 1/. Accordingly, control measures were recommended by the Station and were subsequently carried out by the land managing agencies concerned. The Lassen National Forest disposed of merchantable infested trees in their area by logging. Unmerchantable infested trees, chiefly those of small diameter, were decked and burned 2/. In the Lassen Volcanic National Park the infested trees were felled, bucked and peeled for the most part. Ethylene dibromide in fuel oil was used to a limited extent in some cases for control purposes 3/.

In order to determine the effectiveness of control work carried on in this area, and ascertain whether further steps were required to suppress the outbreak, a postcontrol appraisal survey was necessary. It is the purpose of this report to present the results of this survey.

Procedure and Methods

The postcontrol appraisal was undertaken in September, after the peak period of Jeffrey pine beetle flight. The methods used in making the survey this year were similar to those used in 1953, except that greater effort was made to locate sample plots within the boundaries of the Jeffrey pine type. Previous work had indicated that a better knowledge of the location of the Jeffrey pine would enable the field party to avoid expanses of brush, fir and rock, making the survey job easier and more efficient. Aerial photographs were used to considerable

- 1/ M. M. Furniss. Jeffrey pine beetle, Badger Mountain Area, Lassen National Park and Lassen National Forest, Fall, 1953. Appraisal Survey - Berkeley, Calif., Nov. 3, 1954
- 2/ O. E. Kirkpatrick, Report on Lost Creek and Butte Creek Insect Control Sales. Fall, 1953. Lassen National Forest, January 4, 1954
- 3/ E. H. Lampi. Report on Badger Mountain Control Project, Lassen Volcanic National Park, Spring, 1954 (undated)

advantage in planning cruise strips and in locating plots so that no plots fell out of type.

The survey was made during the period September 7-9, 1954. M. M. Furniss was in charge, assisted by John Rusk and W. D. Bedard, temporary employees of the Division. Also assisting in the work were two employees of Lassen Volcanic National Park, including E. H. Lampi. The sampling unit was a 1/2-acre circular plot. A total of 308 plots of this size were established within the Jeffrey pine type at intervals of 5 chains apart. All trees on each plot were examined for evidence of beetle attack. Newly infested trees were detected by the presence of fresh pitch tubes protruding from the trunk at the point of attack, and a tally of the trees infested was made by diameter classes. At the conclusion of the field work a type map was made based on the aerial photos, and the results of the sampling work were summarized.

### Results

The area surveyed is shown in the appended map. The total area of Jeffrey pine type is 3,500 acres of which 1,700 acres are within Lassen Volcanic National Park and 1,800 acres in Lassen National Forest. Approximately 4.4 percent of this acreage was cruised in the postcontrol appraisal survey. On the basis of this sample, it is estimated that a total of 318 infested Jeffrey pine trees, with a volume of 345,000 board feet, occurred on the 3,500 acres in September 1954. This is equivalent to 0.09 trees, or 99 board feet per acre. Only half of the trees measured in the sample were of merchantable size, however.

The number of infested trees which were logged out or otherwise treated in the fall of 1953 or spring of 1954 over the entire area was 946. Of this total, 774 were on National Forest land and 172 on Park land. Only 446 of the trees on Forest Service land were of merchantable size; these contained a total volume of 592,500 BF. The trees on Park Service land were all of merchantable size and the majority of large diameter. They contained a total volume of 532,000 BF. The number of trees spotted and treated during the control operation considerably exceeded the number estimated in the 1953 appraisal survey largely, it is believed, because of excessive numbers of trees in small diameter classes which were not picked up in the survey. The volume actually logged out in National Forest land was considerably closer to the volume estimated as infested than was the number of trees.

### Discussion

A comparison of the actual number of 1953 infested trees treated (946), with the estimated number of 1954 infested trees present in September (318), indicates that a reduction in loss on the order of 65 percent has resulted following treatment. On the basis of volume, the reduction in loss is slightly more than 75 percent. The estimate of number and volume of 1954 trees is subject to a considerable sampling error; thus the true reduction in loss may have been more or less, depending upon the number of 1954 infested trees actually in the area.

From general observations on the occurrence of the 1954 trees, it appears that there are greater numbers on national forest land, but a larger total volume on national park land. This was the case in 1953, and it is probably the result of a proportionately larger number of small size trees on the Forest. The ratio of merchantable to unmerchantable trees in the postcontrol survey was 1 to 1. In the 1953-54 control operation it was 1.8 to 1.

Recommendation

In view of the reductions in loss that have occurred following last year's control operation, no further control is recommended for the Badger Mountain area at this time.

Berkeley, California  
November 26, 1954

M. M. Furniss, Forester  
C. B. Eaton, Entomologist

# BADGER MOUNTAIN AREA

Shasta Co., Calif.

## LEGEND

- ⊙ Photo center
- ||— Boundary of Jeffrey pine
- - - Lassen Park boundary
- JP Jeffrey pine
- LP Lodgepole pine
- Fir True fir
- Br Manzanita

## SCALE

0 1 2 Mi.

MM Furniss 9-54

GF & RES

